

**CAPITAL STRUCTURE CHOICE: AN EMPIRICAL TESTING OF THE PECKING
ORDER THEORY AMONG FIRMS QUOTED ON THE NAIROBI STOCK
EXCHANGE.**

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**A MANAGEMENT RESEARCH PROJECT IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTERS OF BUSINESS
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DECLARATION

This research project is my original work and has not been presented for the award of a degree in any other university.

Signed..  ..

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This project has been submitted for examination with my approval as university supervisor.

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DEDICATION

To my parents Fredrick and Judy, for their relentless effort to educate me and a strong believe in spear of knowledge & education as the greatest weapon.

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LIST OF ABBREVIATIONS

POT ----- Pecking Order Theory

NSE ----- Nairobi Stock Exchange

NYSE ----- New York Stock Exchange

Debratio ===== New debt as a ratio of total net assets

Deficitratio ===== Financing Deficit as a ratio of total net assets

ABSTRACT

This study uses the Ham-sunder and Myers (1999) POT model, to test whether firms listed on NSE follow the pecking order theory of capital structure in their financing choices. The POT model predicts external debt financing driven by the internal financing deficit. The study used 31 firms listed on NSE for the period between 1998 and 2003.

A graph (fig.1) on average debt to total net assets and average financing deficit to total net assets has indicated no relationship between the two variables. Contrary, to POT model prediction, that is, if firms follow pecking order theory of capital structure then regression of net debt issues on financing deficit should observe a slope coefficient of one; NSE has indicated a slope of .056. The R-squared = 0.0162 which means that financing deficit only determines 1.62% of the variation in amount of new debt borrowed. The other percentage, that is, 98.36% is determined by other factors.

On conclusion, NSE firms do not follow the pecking theory of capital structure in their financing choices. There is therefore, a need to test other theories explaining financing choices in an attempt to determine the one applicable to NSE firms.

1.0 CHAPTER ONE: INTRODUCTION

1.1 Background

1.1.1 The Concept of capital structure

Capital structure represents one of the most controversial issues in the field of finance. The inconclusive controversy was sparked off by Modigliani and Miller (1958) argument, that, there was no optimal capital structure and, therefore capital structure decisions are of no value to a firm. This ignited a lot of contributions from many scholars who include: Stiglitz (1969), Miller (1977), Ross (1977), Jensen and Meckling (1980), Myers (1984), Rajan (1995), Myers (2001) among others.

Capital structure has been defined as a firm's mix of different securities. (Brealey and Myers, 1984). It has also been defined, as the permanent financing of the firm as represented by long-term debt, preferred stock, and common equity. (Weston and Copeland, 1986). Capital structure is different from financial structure in that financial structure includes short term financing in addition to long term financing. The term capital structure is used to represent the proportionate relationship between debt and equity. Equity includes paid up share capital, share premium and reserves and surplus (retained earnings). This study takes the last definition of capital structure, that is, 'proportionate relationship between debt and equity'

In trying to put to rest the controversies surrounding the capital structure many theories have been advanced by various scholars. These theories include traditionalists' view, which holds that a firm can substitute debt for equity to lower the firm's cost of capital (Scott, 1972). Given a set of assumptions Modigliani and Miller (1958), held the theory that a firm's financing mix does not influence firms' value and cost of capital. Miller (1977) introduced an aspect of corporate and personal taxes to MM (1958) theory. He held that capital structure decisions by the firm are irrelevant, that is, changes in the capital structure have no effect on the firms' valuations.

In 1984, Myers introduced a new dimension of thought in explaining financing choices. He advanced the trade-off theory and the pecking order theory of capital structure. A complete overview of various capital structure theories is well documented under literature review.

1.1.2 The Pecking Order Theory

The pecking order theory of capital structure sprung up from inadequacies of trade off theory of capital structure in explaining financing choices. The trade off theory could not explain why most profitable firms use less debt and the fact that firms issue debt frequently but rarely issue equity. This theory could also not account for the reason as to why stock market response to leverage increasing events is strongly positive and negative to leverage decreasing events. It is in light of these limitations that Myers (1984) and Myers and Majluf (1984) came up with the pecking order theory of capital structure.

The pecking order theory holds that due to information asymmetry between managers and less informed outside investors, firms prefer internal funds to external funds. When the internal funds are inadequate for real investments and dividend commitments and there exists a deficit in funds, firms prefer safer debt to riskier equity. Thus, there exists a financial hierarchy descending from internal funds, to debt, to external equity. Funds are raised through equity issues only after the capacity to issue debt has been exhausted.

Shyam-Sunder and Myers (1999) refined the idea of pecking order theory into a testable simple regression model. The model advanced is based on the implication that, under the pecking order theory the variations in net debt issue is explained by a single variable, the internal deficit in funds.

In other words, when the internal funds flow are inadequate to meet the financing needs of the firm then it means that the firm is faced by an internal deficit of funds which it needs to meet through external market borrowing.. Since debt has little information asymmetry problem in the external market, it is sought first and the equity will only be issued if the debt capacity is exhausted. This implies that managers are always reluctant to issue equity and

therefore the internal deficit of funds (DEF) is met using debt issue. This can be interpreted to mean that, the amount of debt a firm issue at a particular period of time (ΔD_t) is solely explained by the amount of internal deficit of funds the firm is facing at the same period of time (DEF_t).

1.2 Statement of the Problem

In Kenya, the pecking order theory perse has not been tested. But studies on capital structure include Kamere (1987) and Omondi (1996) who carried out researches to identify which factors play a significant role in the capital structure decisions. Among the factors considered are asset structure, profitability, size, growth, uniqueness, industry classification and earnings volatility.

Profitability has been identified as one of the major factors that influence capital structure decisions of firms in NSE (Kamere, 1987). According to the pecking order theory profitable firms have less debt since they can meet their financing from internally generated funds. Omondi (1996) disputes this view after making an observation that NSE firms with high returns on investments use relatively high debt. Does this then mean that NSE firms do not follow the pecking order theory of capital structure in their financing choices? As this question begs for an answer, Kiogora (2000) in her regression analysis found a negative relationship between returns of firms quoted at NSE and their level of leverage, which is consistent with the pecking order prediction. In view of the above literature, the two studies have indicated conflicting views regarding the presence of pecking order theory among NSE firms.

The aim of this study is therefore to shed more light on the controversial role of a company's profitability in the choice of its capital structure by applying a specific version of a pecking order model.

1.3 Objective of the Study.

To test the extent to which firms in NSE follow the pecking order theory of capital structure, in financing choices.

1.4 Importance of the Study

The study will be relevant to the following parties.

1. Management and consultants. The study will provide information on patterns of financing, which provides evidence on relative importance of debt and equity issues.
2. Investors. The investors will be in a position to verify the validity of investment decisions based on capital structure signals.
3. Government. The study will provide information that will enable the government plan well on macro-economic issues i.e. liquidity of the market for funds.
4. Academicians. The study will form the basis for academics that wish to study the financing choices in Kenyan context.

2.0 CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Determination of an appropriate long-term source of finance is what the capital structure decisions is all about. This task according to Brealey and Myers (1988) is difficult for management and in their words. "... We cannot say that debt is better.... be better than equity in some cases, worse in others". The difficulty of the task lies in the fact that shareholders expect management to issue a financing combination that attempts to maximize a firms overall market value. This is usually done in an environment full of many conditional ties, which exert influence on this important decision. Kamere (1987) notes these conditions as of the individual firm, the suppliers of funds, and economic, social and legal.

The capital budgeting projects of firms can be financed by retained earnings, by using new equity capital or by borrowing. Use of retained earnings is cheaper but done at the expense of paying out dividends to shareholders. The shareholders would only forgo present income if better investment opportunities exist. (Pandey, 1999).

The use of new equity has no financial distress and liquidation costs, but flotation costs are high. Archer and Faeber (1966) holds the view that flotation costs and a higher required rate of return both contribute in making the issuing of new equity a prohibition for smaller concerns.

Debt may seem favorable because of tax deductibility of interest payments, which makes it a cheaper form of capital. But on the other hand, interest payments on debt are a fixed cost of the business, which makes debt more risky.

The controversy surrounding the choice of debt and equity into the capital structure has boiled to what Myers (1984) called "the capital structure puzzle" into which he identified as "tougher than the dividend puzzle". Studies in capital structure have tried to address this issue and their results have turned out to be inconclusive. Whereas traditionalists give some

evidence on existence of an optimal capital structure. Modigliani – Miller (1958) disputed this and gave further evidence that no such things as an optimal capital structure.

The remaining part of this section is divided into five subsections, which details the developments of capital structure studies. Subsection two covers the relevance of capital structure into which the traditional view, M-M view (1958), M-M view (1963) and Miller (1997) are extensively documented. Subsection three looks at the subsequent developments where financial distress, Agency costs and signaling theory of capital structure are covered. The trade-off theory of capital structure and the pecking order theory of capital structure are extensively covered in subsection four. Some major determinants of capital structure choice are done in subsection five and an overview of capital structure in Kenya is given in subsection six.

2.2 The relevance of the capital structure choice

The debate on whether the capital structure choice is relevant constitutes a bulk of capital structure studies. The controversial debate was sparked of by M-M (1958) when they disputed the traditional view, which held 'the hitherto unchallenged belief on capital structure'. (Kamere, 1987). Durand (1959) identified two extreme views as Net Income (NI) and Net Operating Income (NOI) approach, traditional approach is the compromise between.

2.2.1 The Traditional View

The traditional views according to Kamere (1987) are the views of finance theorists before 1958. This view is founded on the assertion that an optimal capital structure exists and that the value of a firm can be maximized and the cost of capital minimized through careful use of debt. According to this view, the value of the firm can be increased or the cost of capital can be reduced by a judicious mix of debt and equity capital (Pandey, 1999). This implies that the cost of capital decreases within reasonable limit of debt and then increases with leverage. Thus, an optimal capital structure exists and it occurs when the cost of capital is minimized and the value of the firm is maximized. Alexander (1963) better explains the fact that debt funds are cheaper than equity funds carries the clear implication that the cost

of debt, plus the increased cost of equity, together on a weighted basis, will be less than the cost of equity, which existed on equity before debt financing. In other words, the weighted average costs of capital will decrease with the use of debt.

The issue within traditionalists is on the shape of the cost of capital curve. Some see it as v-shaped, which suggests a unique optimal structure while others view it as U-shape suggesting a range of optimum debt levels. Another issue is the fact that some traditional view writers imply the cost of equity function to be horizontal over a certain level and then rising. While others assume the cost of equity function rising slightly in the beginning and then at a faster rate. (Pandey, 1999). However, despite all these inconsistencies among supporters of the traditional view, they all agree that the cost of capital declines with debt.

The validity of traditional view is questioned on the ground that the market value of the firm depends upon its net operating income and risk attached to it. The form of financing does not change net operating income nor the risk attached to it but simply the way in which the income is distributed between equity –holders and debt-holders. (Brealey and Myers, 1988).

Modigliani and Miller (1958) criticize the traditional view on the ground that the assumption that the cost of equity remains unaffected by leverage up to some reasonable limit does not provide sufficient justification for such an assumption. They do not accept the contention that moderate amounts of debt in ‘sound’ firms do not really add very much to the ‘risk ness’ of the share.

However, the traditional view represents a logical appeal and should be dedicated for prompting the kind of rigorous analysis that MM subjected capital structure question to. According to Omondi (1996) the notions of traditional view have subjected to more abstract reasoning and analysis and some contemporary ways of looking at capital structure for example the signaling theory (Ross, 1977) and the Agency theory (Jensen, 1976). Pandey (1999) asserts that the argument of traditional theorists that an optimum capital structure exists can be supported on two counts: the tax deductibility of interest charges and market

imperfections. Therefore, there is no doubt that traditional theorists are important contributors on the debate about financing choices.

2.2.2 The Modigliani– Miller View (1958)

In 1958 Modigliani-Miller challenged the traditional view and termed it as incorrect through their article entitled “The cost of capital corporation finance and the theory of investment”. On the basis of the assumptions that there exists a perfect capital markets, homogenous risk classes, full pay out of earnings MM (1958) concluded that the capital structure of a firm is irrelevant to its value in a world with no taxes. Arbitrage, they argued would ensure that an individuals exposure to risk would not change because home-made leverage was as good as corporate leverage. (Ibid). Arbitrage refers to the buying and selling of identical assets at different prices (Omondi, 1996).

According to MM, if two companies differ only in the way they were financed and in their total market values, then investors would sell their stock of the over-valued firm and buy those of the under-valued firm. This process persists until the two firms value equalizes.

Durand (1959) reacted to MM’s irrelevance theory and questioned the applicability of arbitrage process and the assumption of risk less world.

2.2.3 The Modigliani-Miller View (1963)

In a correction to their original propositions, MM recognized that the value of a firm was dependent on the after tax net cash flows. On this new line of thinking, they concluded that leverage would increase a firm’s value because interest on debt is a tax-deductible expense, and hence more of a leveraged firms operating income flows to investors.

In their first proportions $V_L = V_u + TD$ where V_L represents the value of the levered firms, V_u the unlevered firm and TD the tax savings. This means that the value of the levered firm equals to the value of an unlevered firm in the same risk class plus the gain from leverage which is the value of the tax savings defined by the corporate tax rate times the amount of debt that the firm uses.

Their second proposition stated that the cost of equity to a levered firm is equal to the cost of equity to an unlevered firm in the same risk class plus a financial risk premium whose depends on the difference between the costs of equity and debt to an unlevered firm, then amount of leverage and the corporate tax rate. In equation form is expressed as:

$K_{SL} = K_{SU} + (K_{SU} - K_d) (1 - T) (D/S)$ where K_{SL} is the cost of equity to the levered firm. K_{SU} is the cost of equity to the unlevered firm, K_d is the interest rate on the firm's debt, T is the corporate tax rate, D is the market value of the firm's debt and S represents the market value of the firm's common stock.

The MM (1963) view reduced the difference in the perceived effects of leverage between the differential view and MM's original propositions. They however warned against maximizing of debt in the capital structure, as other sources of finance like retained earnings may be cheaper when personal income taxes are put into consideration. The increasing costs of debt financing and the limitations imposed by lenders may check the amount of debt that a firm can carry. From this view it is appropriate to conclude that the choice between debt and equity is clearly of some relevance.

2.2.4 The Miller Model-1977

Miller (1977) on the basis that MM studies ignored personal taxes introduced a model designed to show how leverage affects firms' values when both personal and corporate taxes are taken into consideration. Miller concluded that with both corporate and personal taxes capital structure decisions by the firm are irrelevant, that is, alterations of the capital structure have no effect on the firm's valuation. His model suggests that in market equilibrium corporate tax advantages are cancelled out by the effect of personal taxes (Van Horne, 1997).

Taggart (1980) extended Millers views to conditions of incomplete capital markets and special costs associated with corporate debt. Its conclusion was that Miller's findings could be upheld to the extent that the tax savings from corporate debt is seen as less valuable than was previously supposed and all equity capital structures are seen as perfectly rational for at least some firms.

Much of the theories of capital structure owes a lot to contributions of Modigliani and Miller. More fundamental is their path-finding article in 1958, which acted as a springboard for all the studies that followed.

2.3' Subsequent Development

These developments have centered much on Stiglitz (1969) work by delineating the major limitations of MM's model based on the assumptions of MM. These studies have particularly attempted to understand the magnitude and implications of market imperfections, for optimal capital structure in the real world. Kraus and Litzenberger (1977) observe that the market imperfections are central on the effects of leverage on firms' market value.

2.3.1 Financial Distress and Capital Structure

Financial distress has been defined as the disruption of normal operating and financial conditions caused by impending insolvency. (Emery, 1998). Brealey and Myers (1988) observe that financial distress occurs when promises to creditors are broken or honored with difficulty. They further observe that sometimes-financial distress leads to bankruptcy and at other times it means only that the firm 'skates on thin ice'. Ross and Westerfield (1988) hold an identical view and further recognize direct and indirect costs of financial distress.

Direct costs of financial distress include legal and administrative costs of liquidation or reorganization. While the indirect costs of financial distress are; loss of sales due to weakened assurance of delivery, inability to take an otherwise profitable investment opportunity, the cost of reorganizing a firm that should be liquidated, loss of financial flexibility and costs from conflicts among claimants.

Financial distress costs will affect both the cost of debt and the cost of equity. If a firm becomes bankrupt, financial distress costs will fall mostly on the bondholders, since equity holders can lose nothing more than their original investment, and in financial distress the original investment of equity investors will have largely disappeared. (Ibid). Financial leverage increases the probability of financial distress and hence the cost of debt capital increases.

On the basis of his study Altman (1984) found out that bankruptcy costs often exceed 20% of firm value. He further observed that costs of financial distress are peculiar to leveraged firms only and they can be high especially as the level of debt rises. Contrary, Emery (1998) observes that any company with fixed costs becomes financially distressed when its cash inflows are insufficient to cover its capital structure. Therefore, even unleveraged firms can face financial distress.

Haugen and Senbet (1978) in their study concluded that bankruptcy costs are not sufficient to influence capital structure.

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2.3.2 Agency Costs and Capital Structure

The bondholders are protected by some covenants against a possibility of management trying to take advantage of them. According to Jensen (1976) these covenants hamper the corporations' legitimate operations to some extent. He further puts that the costs of lost efficiency plus those incurred by monitoring the covenants are what is referred to as agency costs. Agency costs increases the costs of debt and at the same time reduce the value of equity.

Kamere (1987) noted that agency problems may bring about an optimal ratio of debt and equity financing when agency costs related to debt and equity financing are considered. Costs associated with protective covenants are substantial and rise with the amount of debt financing. Shareholders incur monitoring costs to ensure managers' actions are based on maximizing the value of the firm. Jensen and Meckling (1976) noted that with increasing costs associated with higher levels of debt and equity, an optimal combination of debt and equity might exist that minimizes total agency costs.

2.3.3. Signaling Theory and Capital Structure

Ross (1978) introduced signaling theory to finance in which he suggested that managers could use capital structure as well as dividends to give some signals about the firms' future prospects. More specifically, outsiders may interpret increasing the amount of debt in the firms' capital structure as a sign of confidence in a firm's future.

Kamere (1987) notes that signaling theory is closely related to agency problem in that the use of a firm's capital structure to convey information to the market about a firm's profitability is made possible by failure on the part of principals to control actions of management fully.

With a similar view, Haggis and Raviv (1990) contend that in general, managers do not always behave in the best interests of their investors. Debt according to them serves this purpose by offering creditors the option to force the firm into liquidation and it also generates information that can be used by investors to evaluate major operating decisions including liquidation. This suggests that if investors are uncertain about the quality of management and the efficacy of business strategy they can use debt to generate information about these aspects.

Therefore, the expectation is that a debt equity ratio should be balanced between the demands of the firm and the speculations of the investors and the general public about the firm's prospects.

2.4 Explaining the Financing Choice

"The theories of capital structure don't seem to explain actual financing behavior, and it seems presumptuous to advise firms on optimal capital structure when we are so far from explaining actual decisions". (Myers, 1984). It is in this light Myers ushered in two ways of thinking into which he identified as the static trade off framework and pecking order framework.

2.4.1 The Trade off Theory of Capital Structure

Myers (1984), drawing extensively from the work related to MM papers came up with the "trade off theory", in which firm's trade off the benefits of debt financing (favorable corporate tax treatment) against higher interest rates and bankruptcy costs. "A firm's optimal debt ratio is ... determined by a trade off of the costs and benefits of borrowing, holding the firm's assets and investment plans constant" (Ibid). This implies that an optimal capital structure is a result of balancing the value of interest tax shields against various costs of bankruptcy or financial distress.

The trade off theory contrasted MM (1963) by implying that, in real world firms rarely use 100 percent debt. The primary reason is that firms limit their use of debt to reduce the probability of financial distress (bankruptcy) and also that interest rate on debt becomes prohibitively high at high debt levels.

Barclay, Smith and Watts (1995) tested the trade off theory by examining the association between companies market to book ratios and their use of financial leverage. They reasoned that companies with market to book ratios have more growth options (and therefore more to lose in financial distress) than companies with low market-to-book ratios. The trade-off theory predicts that high market-to-book ratio companies will use less leverage to avoid these distress costs and this is exactly what they found.

With identical results were Alderson and Betker (1996). They examined the capital choices of companies emerging from bankruptcy and found that those with high liquidation costs used less debt than those with low liquidation costs. The high liquidation cost companies used methods of debt financing that prescribed their financial flexibility so that they could more easily avoid distress in the future.

The trade-off theory has had a lot of empirical supports (Emery, 1898). On the other hand Myers asserts that none of the evidence noted so far justifies discarding the trade-off theory but its "foolish not to be skeptical". He goes on to say that the theory may sound right to financial economists but business people will give it lip service. He concludes that the theory is a weak guide to average behaviors and it's not of much help in understanding any given firms decisions. In this case the trade-off theory is no more than an open invitation to develop an organizational theory, which leaves the pecking order theory as the contender in the race to explain capital structure. (Stern and Chew, 1998).

2.4.2 The Pecking Order Theory of Capital Structure

The pecking order theory of capital structure is among the most influential theories of corporate leverage and has of recent taken the center stage among the finance theorists. This theory is from Myers (1984) and Myers and Majluf (1984). However Myers (1984) noted that the pecking order hypothesis is "hardly new". He gave Donaldson's 1961 study of the

financing practices of a sample of large corporations as an example. Donaldson had observed that:

Management strongly favored internal generation as a source of new funds even to the exclusion of external funds except for occasional unavoidable 'bulges' in the need for funds. These bulges were not generally met by cutting dividends. Reducing the customary cash dividend payment ... was unthinkable to most management except as a defensive measure in a period of extreme financial distress. Given that external finance was needed, managers rarely thought of issuing stocks. (pg 67)

Contrary to trade off theory, Myers (1984) observed that due to asymmetric information firms based their financing activity on a pecking order. He identified the theory that:

1. Firms prefer internal finance
2. They adopt their target dividend payout ratios to their investment opportunities, although dividends are sticky and target payout ratios are only gradually adjusted to shifts in the extent of valuable investment opportunities.
3. Sticky dividend policies, plus unpredictable fluctuations in profitability and investment opportunities, mean that internally generated cash flow may be more or less than investment outlays. If it is less, the firm first draws down its cash balance or marketable securities portfolio.
4. If externally finance is required, firms issue the safest security first. That is, they start with debt, then possibly hybrid securities such as convertible bonds, and then perhaps equity is a last resort.

The pecking order theory is explained by the information asymmetry between insiders (management) and outsiders (investors). This means that managers know more about their firms than outside investors. This is indicated by the fact that stock prices react to firm announcements of earnings, major capital expenditures, exchange offers, stock repurchases etc. The market simply learns from managers' actions because the managers are believed to have better or earlier information. (Myers, 1998).

Because managers know more about their firms than outside investors do, they are reluctant to issue stock when they believe their shares are undervalued and are therefore likely to

issue when their shares are fairly priced. Investors on the other hand interpret the decision to issue stock as bad news, and firms can only issue stock at a discount. This creates an adverse selection problem in which firms prefer internal to external finance and when outside funds are necessary, firms prefer debt to equity because of lower information costs associated with debt issues and therefore equity is rarely issued. This established the pecking order.

Majluf and Myers (1984) notes that an equity issue becomes feasible in the pecking order only when leverage is already high enough to make additional debt materially expensive e.g. threat of financial distress costs.

The major strength of the pecking order is the fact that it gives a satisfactory explanation as to why profitable firms employ less debt. The reason given is that managers prefer internal funds to external funds in their financing choices hence less debt. However the theory fails to explain why small firms employ little debt than equity yet they are said to be subjected to severe information asymmetry problem. (Murray and Vidham, 2002)

The Pecking order Function.

Since inception in 1984 the pecking order theory of capital structure remained untested until 1999 when Shym-Sunder and Myers developed a model for testing the theory. In summary the pecking order theory holds that supposing there are three sources of funding available to firms that is retained earnings, debt, and equity. Retained earnings have no adverse selection problems and equity is subject to serious adverse selection problems while debt has only a minor adverse selection problem (Murray and Vidham, 2002).

From the point of view of an outside investor, equity is strictly riskier than debt and therefore demands a higher rate of return on equity than debt. From a perspective of those inside the firm, retained earnings are a better source of fund than debt, and debt is a better deal than equity financing. Accordingly, the firm will fund all projects using retained earnings and if the retained earnings are inadequate then debt financing will be used. (Ibid. 2002)

When the firm is facing inadequate amount of retained earnings to finance its investment projects is said to have an internal funds flow deficit. This deficit is equal to the amount of funds that the firm borrows from external market because according to the pecking order theory a firm borrows to meet this deficit.

Therefore,

$$\text{Internal funds flow deficit (DEF)} = \text{Debt issues } (\Delta D) + \text{Equity issues } (\Delta E)$$

But according to the pecking order theory managers are reluctant to issue equity and therefore internal funds flow deficit matches the debt issues as represented below.

$$\text{Internal funds flow deficit (DEF)} = \text{Debt issues } (\Delta D)$$

The above equation implies that the amount of funds that a firm borrows from external market depends solely on the amount of internal funds deficit that the firm seeks to satisfy. In other words, the amount of debt issued (ΔD) by a firm at a particular period of time is explained by the amount of internal funds flow deficit (DEF) the firm is facing at the same period.

Shyam-sunder and Myers (1999) used this logic to come up with the pecking order function below.

$$\Delta D_{it} = a + b_{po} \text{DEF}_{it} + e_{it}$$

Dependent variable: net debt issues (ΔD)

The dependent variable is the net debt issue, which is explained by the changes in internal funds flow deficit. According to the theory the dependent variable (ΔD) should respond with exactly the same magnitude to the changes in independent variable (DEF). This then implies that parameter $a=0$ and the pecking order coefficient, $b_{po}=1$.

The net debt issue of a given year is the difference between long-term debt issuance and long-term debt reduction

Independent variable: Internal funds flow deficit (DEF)

The independent variable (DEF) is constructed from financial statements using accounting figures.

Define notions as below;

Div_t = cash dividends payment in year t

I_t = net investment in year t

Δw_t = change in working capital in year t

C_t = Cash flow after interest and taxes

Using the above notions of funds flow data, the internal funds flow deficit can be given as below:

$$DEF_t = Div_t + I_t + \Delta W_t - C_t$$

The cash dividend account for the internal funds flow deficit because the pecking order theory assumes a sticky dividend policy and therefore a firm can borrow to meet its dividend commitments in the event of inadequate internal funds.

The net investment in year t (I_t) is given by the addition of capital expenditures, increase in investments and acquisitions minus sale of property, plant & equipments (PPE) and investments.

The change in working capital in year t (Δw_t) is given by the working capital of year t minus the working capital of the previous year.

Cash flow after interest and taxes (C_t) is given by addition of income before extraordinary items, depreciation and amortization, extraordinary items and discontinued operations, deferred taxes, other funds from operations, gain (loss) from sale of PPE and other investments.

Other variable: net equity issue (ΔE)

The net equity issue is given by the sale of common stock minus the stock repurchase.

Subsequent tests for the pecking order theory

Various authors in testing the theory have extensively used the pecking order model.

Shyam-sunder and Myers (1999) test strongly supported pecking order theory of capital structure after they tested a sample of 157 firms that had traded continuously in NYSE over the period 1971 to 1989. Fama and French (2002) test also gave similar results.

Nuri (2001) carried out a test using UK data setting where he found out that the pecking order coefficient was low. However, two sub sectors of retail industry indicated a moderate level of support for the pecking order theory of capital structure.

Murray and Vidham (2002) test results did not support the theory. They carried out the regression test using a broad data over the period 1971 to 1998 and found out that the slope was 0.74. the correlation between financial deficit and net equity issues was 0.8 while that of net debt issue and financial deficit was 0.48. These results indicates that a great deal of external financing takes the form of equity, supporting an earlier study by Graham (2000) which concluded that some firms use debt conservatively and that these firms employ more equity than debt. This view also receives support from Lemmon and Zender (2001).

2.5 Major Determinants of Capital Structure Choice

There various attributes that different theories of capital structure suggest may affect the firm's debt-equity choice. These attributes according to Titman and Wessels (1988) are denoted as asset structure, non-debt tax shields, growth, uniqueness, industry classification, size, earnings vitality, and profitability. This study is only interested with the major attributes as given by Kamere (1987).

Asset Structure

Most capital structure theories argue that the type of assets owned by a firm have a major influence in its capital structure choice. Myers (1984) asserts that firms holding valuable intangible assets tend to borrow less than firms holding mostly tangible assets. Long and Malitz (1983) found a significant positive relationship between the rate of capital expenditure (in fixed plant and equipment) and the level of borrowing. Myers and Majluf

(1984) assert that firms may find it advantageous to sell secured debt. They demonstrate that there are costs associated with issuing securities about which the firm's managers have better information than outside shareholders. Issuing debt secured by property with known values avoids these costs.

Tendency of managers to consume more than the optimal level of perquisites may produce the opposite relation between collateralizable capital and debt levels. (Titman and Wessels, 1988). Grossman and Halts (1982) find that higher debt levels diminish with this tendency because of the increased threat of bankruptcy. For this reason, firms especially those with less collateralizable assets may choose higher debt levels to limit their managers' consumption of perquisites.

In Kenya, the view that firms with tangible assets borrow more is supported by both Kamere (1987) and Omondi (1996). This means that firms in Kenya prefer debt issues than equity issues, which is supportive of the pecking order hypothesis.

Growth

As observed by Titman and Wessels (1988) equity controlled firms have a tendency to invest sub optimally to expropriate wealth from the firms' bondholders. The cost associated with this agency relationship is likely to be higher for firms in growing investments. Therefore, expected future growth should be negatively related to long-term debt levels. In support of this Long and Malitz (1983) found a significant negative relationship between rates of investment in advertising and research and development (R&D) and the level of borrowing. Advertising and R&D acts as proxies for growth.

Kamere (1987) has indicated similar views. The predictions of growth on capital structure are in contrast with the pecking order theory prediction. This is because the high growth firms are particularly subject to adverse selection problem and according to the pecking order theory they should be indicative of more debt issues. Using growth as proxy for pecking order theory prediction then, it would be appropriate to conclude that firms in

Kenya do not follow the pecking order philosophy in their financing choices. However, this would be termed too shallow for making such a major conclusion.

Size

There is a relationship between size and the level of leverage (Titman and Wessels, 1988). Chua and McConnel (1982) provide evidence that suggests that direct bankruptcy costs appear to constitute a larger proportion of a firm's value as that value decreases. It is also the case that relatively large firms tend to be more diversified and less prone to bankruptcy. This indicates that large firms should be highly leveraged.

The costs of issuing debt and equity are much more with small firms than large ones. This suggests that small firms may be more leveraged than large firms and may prefer to borrow short term rather than issues long-term debt because of the lower fixed costs associated with this alternative. (Titman and Wessels, 1988). This may be supportive of pecking order prediction since small firms are faced with severe adverse selection problem.

In Kenya, Kamere (1987) found out that long-term debt and the value of total assets (size) are positively correlated. This suggests that the use of debt financing may be higher among large firms than among smaller ones. This is inconsistent with the pecking order theory prediction.

Profitability

Brigham and Gapenski (1990) observed that firms with very high rates of return on investments use relatively little debt. The practical reason is that highly profitable firms do not need to do much debt financing since their high rates of return enable them to do their financing with retained earnings. This behaviour is consistent with the pecking order theory prediction.

Contrary, Omondi (1996) found out that Kenyan firms tend to borrow more when their profits are high. He gives an explanation for this, that high profits serve as an incentive to the firm to invest more and this is what may warrant borrowing for expansion of business.

Omondi's finding on profitability would be indicative that firms in Kenya do not follow the pecking order theory of capital structure in their financing choices.

2.6 An Overview of Capital Structure in Kenya

2.6.1 International context

From an international point of view there is no general consistency in capital structures. RutterFord (1985) provides evidence that Japanese firms depend heavily on debt whereas U.K. and U.S. firms tend to have more equity. The reasons given is that in Japan there is a closer relationships between banks and their client firms and this may have the effect of reducing agency costs of issuing debt than in the U.S and U.K.

Booth et al (2001) analyzed the capital structure choices of firms in ten developing countries and concluded that their capital structure decisions are affected by the same variables as in developed countries. The countries studied are India, Pakistan, Thailand, Malaysia, Turkey, Zimbabwe, Mexico, Brazil, Jordan and Korea.

2.6.2 Kenyan context.

In Kenya Kiogora (2000) presented a summary of capital structures of companies quoted at the NSE. In his findings the average level of equity for all companies was 53.7% with a standard deviation of 25.4. The agricultural sector had the highest level of equity 77% with a standard deviation of 11.42, followed by the insurance sector with 71% and standard deviation of 3.24, then the industrial sector with 58% and a deviation of 20.59, the commercial sector with equity of 51% and a standard deviation of 15.92 and finally the financial sector with equity of 26% and standard deviation of 29.19. he attributes the pattern of financing to the levels of business risk and easiness to obtain finances among the sectors.

3.0 CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research design

This study used Shyam-sunder and Myers (1999) model to test for the existence of the pecking order theory of capital structure among firms listed at NSE. The study is therefore designed to test the following hypotheses.

Null hypothesis (Ho): The NSE firms do not follow the pecking order theory of capital structure in their financing choices.

Alternative hypothesis (Ha): The NSE firms follow the pecking order theory of capital structure in their financing choices.

In testing the existence of pecking theory Shyam-sunder and Myers (1999) developed a simple regression pecking order model below:

$$\Delta D_{it} = a + b_{po}DEF_{it} + e_{it}$$

Where a and b_{po} are parameters. b_{po} is called the pecking order coefficient. Since the theory suggests that the net debt issue is solely explained by internal funds flow deficit (DEF_{it}) then $a=0$ and $b_{po}=1$

The net debt issue (ΔD_{it}) is given by the debt issues minus the retired debt over a given period of time.

The internal funds deficit (DEF) is given by aggregation of net investments, cash dividends, change in working capital minus cash flow after interest and taxes. The cash dividends are considered in the DEF because according to the pecking order theory dividends are sticky and in the event of inadequate internal funds a firm can borrow to honour the dividend commitments.

Define:

Div_t = Dividends payment in year t

I_t = net investment in year t

Δw_t = change in working capital in year t

C_t = Cash flow after interest and taxes

$$DEF_t = (Div_t + I_t + \Delta w_t) - C_t$$

To investigate the pecking order theory the Shyam-sunder and Myers (1999) pecking order model is extensively used. The main variables namely net debt issue and internal funds deficit are constructed from the financial statements. A regression as per the model is ran and the results are compared with the pecking order predictions that parameter $a=0$ and the pecking order coefficient, $b_{po}=1$

However, Murray and Vidham (2002) test results did not support the theory. They carried out the regression test using NYSE data over the period 1971 to 1998 and found out that the pecking order coefficient (bpo) was 0.74. They further did a correlation between internal funds deficit and net equity issues and found a strong positive correlation of 0.8 while that of net debt issue and internal funds deficit was 0.48. These results indicates that a great deal of external financing takes the form of equity, supporting an earlier study by Graham (2000) which concluded that some firms use debt conservatively and that these firms employ more equity than debt.

The major strength of the pecking order is the fact that it gives a satisfactory explanation as to why profitable firms employ less debt. The reason given is that managers prefer internal funds to external funds in their financing choices hence less debt. However the theory fails to explain why small firms employ little debt than equity yet they are said to be subjected to severe information asymmetry problem. (Murray and Vidham, 2002)

3.2 Population and sample

The population consists of companies quoted on NSE and have traded continuously for the period between January 1998 and December 2003. Financial sector companies and other regulated firms will be excluded. 31 firms satisfied the conditions and formed the sample of the study. The list of the firms is shown under appendix II.

3.3 Data Collection and specification

This study was wholly based on secondary data from published annual reports filed with NSE secretariat. For each of the firm in the sample and each of the years in the sample period, data that would enable computation of main variables: Internal funds deficit, Net debt issues and Net equity issues was collected. Specifically, the data collected from financial statements for each firm and in each year include:

- For internal funds flow deficit, items of cash dividends, investments', working capital and internal cash flows were collected. This data is sourced from cash flow statements and the balance sheets.
- For net debt and net equity the data on debt issue, debt retired, equity issued and common stock repurchase will be gathered from the cash flow statements. The presentation of data collection items is shown under collection sheet specimen in appendix I.

3.4 Data Analysis and model specification

This study tested the relationship between internal funds flow deficit (DEF_{it}) and net debt issue (ΔD_{it}) in two ways; by use of a graph and Shyam–Sunder and Myers (1999) pecking order model.

3.4.1 The graph.

A graph indicating the relationship between internal funds deficits and the amount of new debt issued overtime is drawn. The figure plots annual averages of the ratios of financing deficit to total net assets and new debt issued to total net assets for the 31 firms over the period 1998 and 2003. A time series relationship over the two variables is therefore depicted by the graph.

4.2 Shyam–Sunder and Myers (1999) pecking order model.

A simple regression pecking order model is as below.

$$\Delta D_{it} = a + b_{po}DEF_{it} + e_{it}$$

Where e_{it} is the error term.

The independent variable. (DEF_{it})

This is the internal funds flow deficit (DEF_{it}) which is the explanatory variable for net debt issue (ΔD_{it}). From the data collected, the DEF_{it} for each firm is computed. The following formula is used to calculate the internal funds flow deficit for a firm in a given year (DEF_{it}).

$$DEF_t = (\text{Div}_t + I_t + \Delta W_t) - C_t$$

Div_t is the cash dividend paid by a firm in year t. this figure will be directly acquired from the financial statements of firms.

The net investment in year t (I_t) is given by the addition of capital expenditures, increase in investments and acquisitions minus sale of property, plant & equipments (PPE) and investments. These figures are directly acquired from cash flow statements.

The change in working capital in year t (Δw_t) is given by the difference between working capital in year t and the working capital of the previous year, t-1. The figures on working capital will come from the balance sheet of each firm in the sample.

Cash flow after interest and taxes (C_t) is given by addition of income before extraordinary items, depreciation and amortization, extraordinary items and discontinued operations, deferred taxes, other funds from operations, gain (loss) from sale of PPE and other investments.

The dependent variable (ΔD).

The dependent variable is the net debt issues (ΔD), which should respond with the same magnitude to the changes in independent variable (DEF_{it}). This therefore means that the pecking order theory predictions are that parameters a=0 and bpo=1. (Ibid. 1999)

Model specification

This POT test was based on 31 firms in the sample. The variables; internal funds deficit (DEF_t) and net debt issue (ΔD_t) is the averages of respective variables for all the firms in the

sample for each year. Therefore, each variable is given as a single figure for each year. This involved the following steps of data analysis:

- The first step involved computing the average figures of the variables from the data of figures of individual firms. These average figures were given as:

$$\text{Internal funds flow deficit (average), } DEF_t = \frac{1}{n} \sum_{I=1}^n DEF_{it}$$

$$\text{Net debt issue (average), } \Delta D_t = \frac{1}{n} \sum_{I=1}^n \Delta D_{it}$$

$$\text{Net equity issue (average), } \Delta e_t = \frac{1}{n} \sum_{I=1}^n \Delta E_{it}$$

- The second step was to run the pecking order regression model. In this case the pecking order model was modified as below.

$$\frac{1}{n} \sum_{I=1}^n \Delta D_{it} = a + b_{po} \frac{1}{n} \sum_{I=1}^n DEF_{it} + e_{it}$$

- The third step was to test the significance of the relationship between variables in the model using t-statistics. 95% confidence level was used.
- Finally, the model results of the parameters a, and bpo were compared with the pecking order theory prediction of the same that, a=0 and bpo=1.

4.0 CHAPTER FOUR: EMPIRICAL RESULTS AND INTERPRETATION

4.1 RELATIONSHIP BETWEEN DEBT AND DEFICIT

The study used 31 firms listed on the NSE due to the availability of the data. The descriptive statistics of the data used are in table 4.1 below:

Table 4.1: Descriptive Statistics of Data used in the Estimation

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|--------------|-----|----------|-----------|-----------|----------|
| Debtratio | 31 | .0189003 | .0683887 | -.0884091 | .2512264 |
| Deficitratio | 31 | .0401589 | .1539221 | -.2319434 | .521372 |
| Residual | 31 | 1.80e-10 | .0678312 | -.107132 | .2077416 |

The variables are defined as follows:

| Variable Name | Variable Label |
|---------------|--|
| Firm | Firms listed on the NSE |
| Debtratio | New Debt as a ratio of Total Assets |
| Deficitratio | Deficit as a ratio of Total Net Assets |
| Residual | Random Error Term that has zero mean and constant variance |

The correlation matrix in table 4.2 below shows that there is positive correlation (0.1274) between debt ratio and deficit ratio (though the Spearman's rank correlation is negative). But they are independent as shown by ($\text{Prob} > |t| = 0.2888$), which means that we can reject the null hypothesis that debt ratio and deficitratio are independent.

Table 4.2: Correlation Matrix, Rank Correlation and Test for Independence between debt ratio and deficitratio

| | debtratio | deficitratio |
|--|-----------|--------------|
| debtratio | 1.0000 | |
| deficitratio | 0.1274 | 1.0000 |
| Number of obs = | 31 | |
| Spearman's rho = | -0.1967 | |
| Test of Ho: debtratio and deficitratio are independent | | |
| Prob > t = | 0.2888 | |

4.2 DIAGNOSTIC TESTS FOR THE ERROR TERM

Before we carried out the estimation of the debt ratio and deficitratio equation we tested whether the error terms satisfy the constant variance and normality assumption of the OLS method using the Cook-Weisberg test for heteroskedasticity and the Jarque-Bera normality test. The results of the tests as vindicated by the p-values in table 4.3 show that the error

term a constant variance and is normally distributed and therefore can be estimated using OLS method assuming that other assumptions hold.

Table 4.3: Test Results for Constant Variance and Normality of the Error Term

(a) Cook-Weisberg test for heteroskedasticity using variables specified
 Ho: Constant variance
 chi2(1) = 0.02
 Prob > chi2 = 0.9012

(b) Skewness/Kurtosis tests for Normality

| Variable | Pr(Skewness) | Pr(Kurtosis) | adj chi2(2) | joint Prob>chi2 |
|-----------|--------------|--------------|-------------|-----------------|
| residuals | 0.000 | 0.005 | 16.98 | 0.0002 |

4.3 ESTIMATION RESULTS

The estimation results of the cross sectional data using the ordinary least squares are shown in table 4.4 below:

Table 4.4: Estimation Results

| Source | SS | df | MS | Number of obs = | 31 |
|----------|------------|----|------------|-----------------|--------|
| Model | .002278431 | 1 | .002278431 | F(1, 29) = | 0.48 |
| Residual | .138031988 | 29 | .004759724 | Prob > F = | 0.4945 |
| Total | .140310419 | 30 | .004677014 | R-squared = | 0.0162 |
| | | | | Adj R-squared = | 0.0077 |
| | | | | Root MSE = | .06899 |

| debratio | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] |
|--------------|----------|-----------|------|-------|----------------------|
| deficitratio | .0566183 | .0818332 | 0.69 | 0.495 | -.1107494 .2239859 |
| _cons | .0166265 | .0128195 | 1.30 | 0.205 | -.0095923 .0428453 |

The estimation results from table 4.4 show that the coefficient of tenure for deficitratio is positive and highly insignificant at 5% significance level as indicated by the t-statistic and the corresponding $p>|t|$ values; while that of intercept term is also positive and insignificant at 5% significance level. The $R\text{-squared} = 0.0162$ indicate that deficitratio determines only 1.62% of the variation in the debratio. The other percentage, that is, 98.38% is determined by other factors. This implies that the 31 firms used in the sample do not follow the pecking order hypothesis.

The post estimation specification test that the linear regression model is not correctly specified, using the link test is decisively rejected at 5% as shown by the p-value ($\text{Prob} > F =$

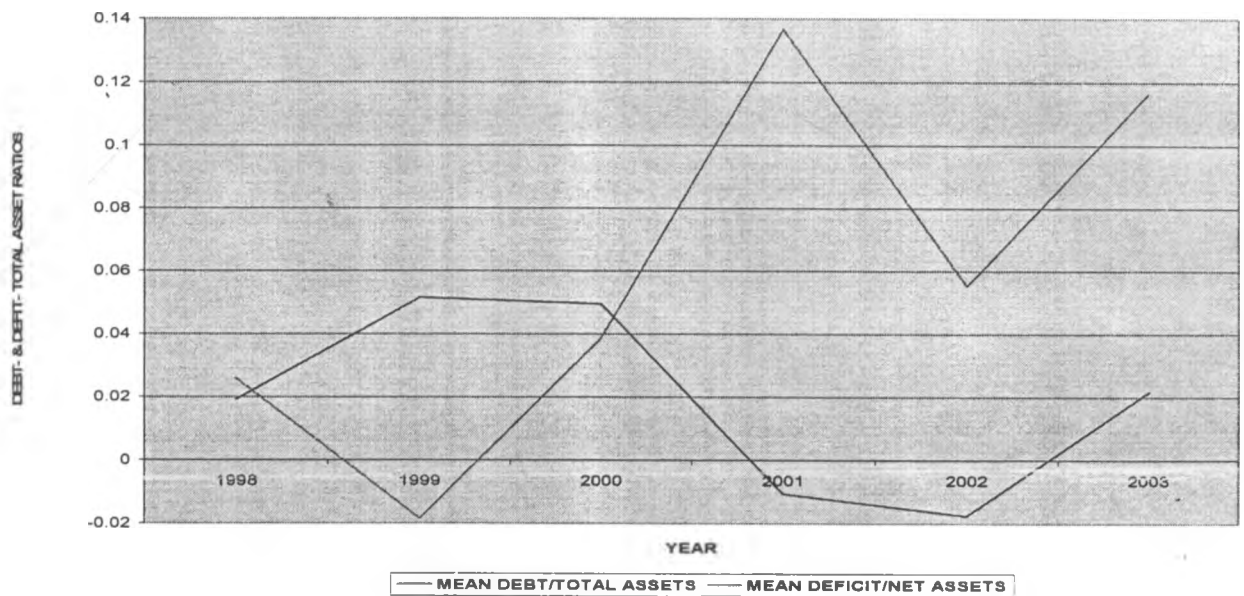
0.0110). This shows that the estimated model was correctly specified and hence the results are consistent and unbiased. The test results are shown in table 4.5 below:

Table 4.5: Post Estimation Results for Specification Test

| Source | SS | df | MS | Number of obs = | 31 |
|----------|------------|----|------------|-----------------|--------|
| Model | .038618462 | 2 | .019309231 | F(2, 28) = | 5.32 |
| Residual | .101691957 | 28 | .003631856 | Prob > F = | 0.0110 |
| | | | | R-squared = | 0.2752 |
| | | | | Adj R-squared = | 0.2235 |
| | | | | Root MSE = | .06026 |

| debratio | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] |
|----------|-----------|-----------|-------|-------|----------------------|
| _hat | -14.93017 | 5.191922 | -2.88 | 0.008 | -25.56534 -4.295001 |
| _hatsq | 305.228 | 96.49305 | 3.16 | 0.004 | 107.571 502.8851 |
| _cons | .1696173 | .0596814 | 2.84 | 0.008 | .0473654 .2918691 |

FIGURE 1: MEAN DEBT/TOTAL ASSET & DEFICIT/TOTAL NET ASSETS RATIOS



The above chart is drawn using the data below calculated as the mean of each of the debt/total asset and deficit/total net asset for the 31 firms for each of the six years from 1998-2003.

5.0 CHAPTER FIVE: SUMMARY, CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

5.1 SUMMARY

The objective of this study was to assess whether firms listed in NSE follow the pecking order theory of capital structure in their financing choices. To achieve this two approaches are used. First, a graph (fig.1) of POT model variables, that is, average new debt to total net assets and average financing deficit to total net assets was drawn to show their relationship overtime. Second, a cross-sectional regression of POT model was ran to capture the overall market behaviour in the light of pecking order prediction.

The study used secondary data from NSE in which 31 firms were analysed for a period of six years running from 1998 to 2003. The conclusion based on the research findings are discussed here under.

5.2 CONCLUSION

The graph (fig.1) has indicated no relationship between financing deficit and new debt issued among firms quoted on NSE. In light of pecking order theory of capital structure, the curves depicting the two variables, that is, financing deficit and new debt issue would be expected to match very closely with similar movement patterns.

The correlation matrix in table 4.2 shows a weak positive correlation (.1274) between financing deficit and new debt issued.

The cross sectional regression results table 4.4 show that the pecking order coefficient is positive (.057) and highly insignificant at 5% significance level as indicated by the t-statistic; while that of intercept term is also positive and insignificant. The R-squared =.0162 which means that financing deficit only determines 1.62% of the variation in amount of new debt issued. The other percentage, that is, 98.36% is determined by other factors.

In conclusion, the NSE firms do not follow the pecking order theory of capital structure in their financing choices. This therefore means that other theories explaining financing choices need to be tested in a bid to find the applicable among NSE firms.

5.3 LIMITATIONS OF THE STUDY

During the study several limitations were noted;

First, the study has only used 31 firms from a population of 48 firms quoted on NSE.

Second, a time series regression of POT model could not be conducted due to small sample size defined by the period of study.

Third, new equity issue as a variable was not materially used in this study because NSE firms are not active in issuing new equity or conducting share repurchase.

5.4 SUGGESTIONS FOR FURTHER STUDIES

This study has revealed a need for the following studies to be done in Kenyan context:

First, a test for the signaling theory of capital structure among firms quoted on NSE.

Second, a test of the pecking order theory of capital among firms not quoted on NSE.

Third, a test of trade-off theory of capital structure among firms quoted on NSE.

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APPENDICES

Appendix 1.

Data collection sheet.

Name of the company:

| YEARS | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | TOTALS | AVERAGES |
|------------------------------------|------|------|------|------|------|------|--------|----------|
| CASH DIVIDEND (a) | | | | | | | | |
| INVESTMENTS(b) | | | | | | | | |
| CHANGE IN WORKING CAPITAL(C) | | | | | | | | |
| INTERNAL CASHFLOW(d) | | | | | | | | |
| INTERNAL FUNDS DEFICIT(a+b+c-d) | | | | | | | | |
| NET DEBT ISSUE(e) | | | | | | | | |
| NET EQUITY ISSUE(F) | | | | | | | | |
| NET EXTERNAL FINANCING(e+f) | | | | | | | | |